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contraction of the horny albumen which surrounded the seed. The seeds were oval and in a smooth bony envelope, and when the albumen had burst and expanded enough to get just beyond the middle where the seed narrowed again, the contraction of the albumen caused the seed to slip out with force, just as we would squeeze out a smooth tapering stone between the finger and thumb.

ALPINE FLOWERS.—Dr. Parry, having devoted the whole summer to a third botanical exploration of the Colorado Rocky Mountains, has prepared beautiful sets of the more remarkable and novel Alpine flowers of the region, consisting of above a hundred species. A limited number of these sets, interesting as *souvenirs* of travel as well as to botanists, may be obtained for twelve dollars a set upon application to Dr. Parry at Davenport, Iowa, or to the Naturalists' Agency in Salem.—A. G.

## ZOOLOGY.

THE ZOOLOGICAL STATION OF NAPLES.—An undertaking which cannot fail to have an important influence on the progress of zoology has been started at Naples. A zoological station to be in charge of a permanent zoological observer and opened under certain restrictions to all workers who may wish to avail themselves of its facilities. It will form the natural complement of the advantages zoologists and anatomists now derive from the great zoological gardens of London and Paris, which constantly supply so much valuable material for study to the members of the Zoological Society of London and the Professors of the Jardin des Plantes. Hitherto all the work done on the seashore has necessarily been more or less interrupted; usually a stay of a few weeks at one place has been the utmost length of time which naturalists have been able to devote to one of the most fruitful branches of research in Zoology. Occasionally a more favored individual spends a few months on the seashore, but these are exceptions. All who have had occasion to pursue embryological studies on the seashore, or to trace the habits and study the anatomy of our marine animals, know how difficult it is to obtain just the material which is wanted. To make a complete embryology of a single marine animal often requires several years of unremitting devotion to one subject and, in order to obtain missing links, one must study on the

seashore what he happens to find. It is impossible to obtain certain stages of growth except at stated seasons, which are not always the time when the seashore is accessible. The value therefore of permanent stations cannot be overestimated. The zoologists in charge will little by little learn the habits of the more common species and by making the materials accessible to special research save an immense amount of time now devoted to exploring the ground. A zoological station on the seashore will become for biology, when fully equipped, the equivalent of first class observatories, and when other stations are established on well selected points along the coasts of different countries we may hope to gain the materials for the solution of many most interesting problems in Natural History which individual exertions could hardly hope to solve.

A better spot than Naples could not have been selected to make a start; rendered classic by the important memoirs which have been published upon the animals of its bay, the student will at once have a guide and models to follow.

May we not hope that the noble example given by Dr. Dohrn will be imitated in this country and that in connection with some of our leading Universities, Practical Schools of Biology will be established, where Professors and Students will find abundant material to pursue their favorite studies?—A. AGASSIZ.

The “Spener’sche Zeitung” (Berlin) publishes the following extract from a private letter:—On the narrow strip of coast which separates the park of the Villa Reale from the sea, a large stone building is at present being erected at Naples, quietly and almost unnoticed; at least the Neapolitan press has paid no attention to it. The strength of the foundations—it has taken three months to lay them—shows that they are intended for an edifice of considerable size and durability, and on making inquiries I have learned that this is the *Zoological Station* which has been occasionally mentioned by Italian, German and English journals during the last few months. It has been organized and is being built by a young German naturalist, Dr. Anton Dohrn of Stettin, who until a few years ago was a private teacher at the university of Jena. He has paid nearly the whole of the expenses, which amount to about 50,000 thalers (£7500) out of his own pocket, the only assistance he has received having come from a few personal friends, who have lent several thousands of thalers for the purpose. The following is a short sketch of his plan. The ground floor of the

building, which covers an area of about 8000 sq. ft., contains a great aquarium, which will be opened to the public. Dr. Dohrn hopes that the money thus obtained will not only suffice for all the expenses of the aquarium, but also afford a surplus to be employed in covering a part of the requirements of the upper story, which is to be exclusively devoted to scientific purposes. Besides the officials and servants employed in the aquarium, several young zoologists will be attached to the station and receive a regular salary from the Director, Dr. Dohrn. Thus a number of new positions will be opened up for young scientific men. But this is not all. As the only duty of these zoologists will be to devote themselves to certain branches of scientific work, and their exertions will be carefully directed and organized, as has long been the case in astronomical and meteorological observatories, there is every reason to hope that scientific research will be greatly facilitated and advanced by their labors. In the upper story of the Zoological Station, laboratories will also be prepared for the use of naturalists coming from other parts of Italy and from abroad. For this purpose a large scientific library will be founded, Dr. Dohrn's very considerable private collection serving as a nucleus; and about twelve tables fully furnished with the necessary appurtenances established. Each of the latter will be provided with a number of tanks supplied with a constant stream of sea-water. Sea fishing and dredging will be conducted on an extensive scale by means of several boats to which, if the necessary means are forthcoming, a small steam-yacht will be added. The animals taken will be given to the zoologists for scientific treatment. It is more than doubtful, whether all these rich and expensive conveniences can be furnished to zoological visitors without any pecuniary compensation, but I hear that Dr. Dohrn has drawn up a plan which will enable even naturalists of limited means to enjoy the advantages of the Station. He proposes to offer one or more tables to various Governments and scientific societies for a fixed annual sum. These tables and all the scientific resources of the Station will at once be placed at the disposal of any naturalist who brings a certificate from the government, university, or scientific body to which the table has been let. This plan, among its many other advantages, seems to be a successful attempt to solve the difficult question as to how it is possible to unite a complete self-administration on the part of scientific bodies with the reception of pecuniary assistance

from their Governments. Dr. Dohrn speaks in the most grateful manner of the assistance rendered him by the German authorities in Italy, especially by Mr. Stolte, the Consul-General at Naples, while at the same time he warmly acknowledges the interest in his undertaking, displayed by the government of Italy, more particularly by Signor Correnti and Signor Sella, the late and the present minister of Public Instruction. The difficulties in the way of the execution of his plans were neither few nor small, as may be gathered from the fact, that in spite of the readiness displayed by the municipal authorities of Naples, more than two years elapsed before a definitive contract could be concluded between the town and Dr. Dohrn with respect to the cession of a suitable site for the building.

[We are happy to add our testimony to the great value and importance of such a biological station as this. Late in May one of the editors of this journal visited the foundations of the Naples aquarium, and was surprised at the magnitude of the building, and the admirable natural advantages of the situation, and he predicts a grand success to the undertaking; the Italian government will undoubtedly cherish and protect the institution when its value shall be demonstrated. We hope that the success of this station may lead to the establishment of a zoological station on the American coast. Surely the zeal and money would not be wanting with us, if some one would take the lead; and such a station properly conducted and with due regard to popular wants, would be undoubtedly self sustaining. Indeed it is not a little surprising that public aquaria and zoological gardens on a large scale have not been established in the United States before this, as those of London, Paris, Hamburg, Berlin, etc., are, we believe, well sustained. — Eds.]

FAUNAL PROVINCES OF THE WEST COAST OF AMERICA.—At a recent meeting of the California Academy of Sciences, Mr. Stearns called the attention of the members to certain provincial divisions in the marine faunæ of the west coast of America suggested by Prof. Verrill in the Transactions of the Connecticut Academy of Sciences for 1871.

Mr. Stearns remarked, more particularly regarding the coast from Cape St. Lucas northward, that to divide this portion upon the data at present made known, so as to make provinces which should correspond with those of the Atlantic side, is not warranted

by the knowledge possessed at the present time ; that the topography and geology of that portion of the west American coast, specified by him, was much more uniform in its character, as well as in the temperature of its waters, than that of a corresponding section in extent of the Atlantic coast, to say nothing of the influence of the coast currents which upon our coast are peculiar, and which enter largely in the matter of distribution of species ; furthermore that the manuscript data in his possession, which were, to say the least, fully as important as what had already been published, and quite likely more authentic, indicated a greater range of coast to each province and therefore a less number of provinces than suggested by Prof. Verrill.

Though much had been done by himself, and other members of the Academy cooperating with him, in the accumulation of data bearing upon the geographical distribution of the mollusca of our coast, still so much remained to be done in order to make the work thorough and reliable, that it would be merely arbitrary and necessarily require frequent readjustment to propose at this time any new divisions or subdivisions of the coast into zoological provinces.

As to that part of the west coast of North America from Cape St. Lucas, including the Gulf of California, thence southerly to a point a few miles south of Panama, with the exception of collections made at a few places in the Gulf of California, also at San Juan del Sur and its immediate vicinity on the coast of Nicaragua, and in the Bay of Panama, almost nothing more is known of this vast reach of shore line than was known years ago.

Mr. Stearns stated that at some future time, as soon as the data collected by himself and colaborers here could be compiled, he proposed to refer to this subject again.

ON ZOOLOGICAL BARRIERS, WITH SPECIAL REFERENCE TO SOUTH AMERICA.—How far the present lofty mountain-chains and broad rivers arrest dispersion is an interesting and important question. Every fact throwing light upon it is a valuable contribution to science. It would seem that in temperate regions the mountains are greater barriers than in the tropics. Mr. Darwin says that we ought not to expect any closer similarity between the organic beings on the opposite sides of the Andes than on opposite shores of the ocean. My own observations on the equatorial Andes corrobora-

rate this statement, though it is more strikingly true of the Chilian Cordilleras and, as Mr. D. has remarked, is truer of quadrupeds and reptiles than of birds and insects. I know of fifty-six species occurring on both sides of the Andes of Ecuador, excluding all highflying Accipiters and all species ranging north of Panama.

Of Mammals, one monkey and one pachyderm; of Birds, one thrush, two wrens, one vireo, five tanagers, two antcatchers, two flycatchers, five hummers, one trogon, one sawbill and one wader; of Reptiles, ten ophidians, two saurians and one batrachian; of Insects, seventeen lepidopters; of Mollusca, three Bulimi.

The Amazons, the Rio Negro and the Madeira divide the great plain into four districts, apparently similar in vegetation, climate, etc. Yet these rivers act as barriers to several species, and native hunters, understanding the fact, cross the river to procure certain animals. Five species of monkeys are confined to the north bank of the Amazons, and two to the south side. The blue macaw, green jacamar and curl-crested toucan never cross the Great River, though butterflies are known to fly over it. What is the cause of this isolation? Not the forest, for there is not a single tree which is not found both on the northern and southern banks.—Prof. JAMES ORTON.\*

ABSENCE OF EYES IN CLASSIFICATION.—Dr. Hagen's objection to the generic estimation of the lack of visual organs in the cave crustaceans is even less weighty than I had supposed; viz., the fact that in certain cave insects, the female sex only is deprived of eyes, the males possessing them. No one knows better than Dr. Hagen, that in many genera and even families and higher groups of insects the definitive characters are only to be found in the male sex; and I believe that in some crustaceans it is the female which exhibits the greatest departure from the embryonic starting point. In each case the most extensively developed sex must of necessity furnish the characters which determine the status of the species. But it is unnecessary to refer to special cases of this kind, for as I have already shown, the developmental status of the eyes in the blind catfish is very variable in both sexes and opposite sides of the head. This would have been a far better reason for rejecting the recognition of this character as generic. But on

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\* Abstract of a paper read at the American Assoc. Adv. of Sci., 1872.

the same grounds we must reject *all* characters now regarded as generic, for there is scarcely one which cannot be found to be variable in some species in some more or less remote region of the animal kingdom, recent or extinct. Hence, as I have often urged, it is the *constancy* of a character in the group of species where it exists that determines its value. This is the philosophy of universal custom. The same remarks may apply to my *Orconectes inermis*. Though I could not make it agree with Dr. Hagen's second form of *O. pellucidus*, it may be such, as Dr. Hagen's knowledge of these animals is much greater than mine, and I would at once accept his determination in the case. But what are these "forms"? If inconstant they are only varieties; if constant, species.—EDWARD D. COPE.

VITALITY AND SEX.—Prof. Riley mentioned at the meeting of the American Association a few interesting entomological facts in support of Dr. Hartshorne's paper, and to show that in some way or other the male element is connected with defective vitality. In studying *Phylloxera vastatrix*, or the grape-root louse, he had always found the male pupæ most abundant on such roots as had been most depleted and where the insects were already beginning to die off for want of sufficient nutrition.

In the common oyster-shell bark-louse of the apple tree (*Mytilaspis conchiformis*), which had been increasing and spreading for many years past in the northwestern states, something similar occurred. The male of this species had been sought in vain for a quarter of a century both by entomologists and horticulturists; and they were forced to the conclusion that the species multiplied agamically and despaired of ever finding the male. But for the past three or four years this insect has been rapidly dying out in those sections where it once flourished, until at last it is no longer dreaded by the orchardist. Under these conditions of lessened vitality the male element suddenly appears, and Mr. Riley had the satisfaction of discovering it the present summer.

"SPIKE-HORNED MULEDEER."—In the July number of the NATURALIST, Prof. E. D. Cope refers to a supposed specimen of a spike-horned muledeer (*Cervus macrotis*) obtained in Kansas. Without questioning the probable occurrence of "spike-horns" in *C. macrotis*, the size of the horns mentioned by Prof. Cope seems to render the reference of the specimen in question to *C. macrotis* somewhat



open to doubt. The length of the spike in this case is said to be two feet and a half, which is enormous when it is considered that the fully developed antlers of old bucks of this species rarely much exceed two feet, measured along the curvature of the beam to the end of the longest point. On the other hand, it is just such a spike as is usually developed in a two-year old buck elk (*C. Canadensis*), an animal also common in Kansas along the Kansas Pacific Railway.

The occurrence of spike-horned bucks in *C. Virginianus*, which has of late attracted so much attention, seems in no way remarkable. Prof. Baird, in writing of the *C. Virginianus* in 1857, says, "Sometimes a perfectly adult, full-grown male will have but a single slender spike, thus resembling the buck of the second year." (Mam. N. Amer., p. 647.)—J. A. A.

Since the above was written I have learned from Prof. Cope that he at first also regarded the horns as those of a two-year old elk, and only referred them to *C. macrotis* on being assured that the elk did not occur at the locality (Fort Hays, Kansas) where these horns were obtained. From personal knowledge, however, I am able to affirm that the elk is of quite common occurrence within a few miles of Fort Hays.—J. A. A.

THE RATTLE OF THE RATTLESNAKE. — At a meeting of the Essex Institute in May last Mr. F. W. Putnam gave a description of the structure of the horny appendage to the tail of many snakes, especially developed in the genus of Rattlesnakes, and controverted the idea of natural selection having anything to do with its peculiar development. He also thought that the supposition that the rattle was a benefit to the snake, as a means of enticing birds, by its sound imitating that made by the Cicada, as suggested by a writer in a late number of the NATURALIST, could not be accepted. The Cicada, during the few weeks that it existed in the adult state, at which time the males made their peculiar drumming, was not a ground insect, and was not very abundant, even among the trees, in such localities as were most frequented by the rattlesnake. Secondly, the sound made by the snake was very slight under ordinary circumstances, and the rattle was not sounded to any extent unless the snake was disturbed by some cause. His own observations on these snakes, in their natural habitat, led him to believe that it was not at all their nature to

set up a rattling for the sake of enticing birds to them, but that they would slowly and cautiously approach their victim, or else lie in wait ready to give the fatal spring upon anything that came near. He believed that the rattle was in reality a detriment to the snake, except in so far as it served to call the sexes together, which he thought was most likely its true function.

FLIES AS A MEANS OF COMMUNICATING CONTAGIOUS DISEASES.—Prof. Leidy remarked at a late meeting of the Academy of Natural Sciences of Philadelphia, that at this time, during the prevalence of small pox, he was reminded of an opinion he had entertained that flies were probably a means of communicating contagious disease to a greater degree than was generally suspected. From what he had observed in one of the large military hospitals, in which hospital gangrene had existed, during the late rebellion, he thought flies should be carefully excluded from wounds. Recently he noticed some flies greedily sipping the diffuent matter of some fungi of the *Phallus impudicus*. He caught several and found that on holding them by the wings they would exude two or three drops of liquid from the proboscis, which, examined by the microscope were found to swarm with the spores of the fungus. The stomach was likewise filled with the same liquid, swarming with spores.

## G E O L O G Y.

EXTINCTION OF BIRDS IN MAURITIUS, ETC.—I believe I have demonstrated, by the examination of the bones which have been found in the recent deposits in the Mascarene Islands, and which belong, for the most part, to extinct species, such as the dodo, the solitaire, the aphanapterex (*Fulica Newtoni*), large parrots, etc., that these islands have once been part of a vast extent of land, that these lands, by little and little and by a slow depression, have been hidden under the waters of the ocean, only leaving visible some of their highest points, such as the islands of Mauritius, Rodriguez, and Bourbon. These islands have served as a refuge for the last representatives of the terrestrial population of these ancient epochs; but the species, confined in too limited a space and exposed to all causes of destruction, have disappeared by degrees; and man has in some measure aided in their extinction.

Madagascar evidently was not in communication with these islands; for when Europeans visited them for the first time, they